Ethiopia National Logistics Masterplan
Diagnostics Study

NKE6: TTTFP Expert
NKE7: Railway Expert
NKE8: Road Engineer (Operations)
NKE9: Road Engineer (Design)
NKE10: O/D Survey and Freight Projections Expert
NKE11: Shipping Data Expert
NKE12: Warehousing and Logistics Systems Expert
NKE13: PPP and Financing Expert

1 Introduction

Prior to 2021, Ethiopia was one of the fastest growing economies in the World, with registered GDP growth rates of over 8 per cent over 15 years. GDP growth rates were driven by a massive public investment programme which reached almost a quarter of the country's gross domestic product in 2014 and has accounted for around half of all growth in the economy since 2011. This has resulted in a significant improvement in road, rail and energy infrastructure and construction of mega-projects such as the Grand Ethiopian Renaissance Dam (GERD) and the Ethiopia-Djibouti Railway.

Although the Government of Ethiopia has been trying to get the economy back on track, post COVID, there are many challenges to overcome. The Home-Grown Economic Reform Programme seeks to address macroeconomic imbalances and unlock structural and sectoral bottlenecks and improve governance of state-owned enterprises and strengthening institutional capacities. Measures to open key sectors to competition, notably transport, logistics, manufacturing, and telecommunication, are expected to attract private investment, catalyse high value-added services, and boost competitiveness.

However, Ethiopia's international trade competitiveness is constrained by foreign exchange shortages, unstable electricity supply, poor access to credit, weaknesses in raw material supply chains, shortages of skilled labour and trade facilitation and logistics challenges. Ethiopia's trade balance is continuously negative, and, in the fourth quarter of 2021, Ethiopia recorded a trade deficit of USD 3433.60 million, which is the highest deficit recorded since the last quarter of 2018[1].

Reducing the trade deficit is dependent not only on improving production, which also relies on imports, such as fertiliser for increased agricultural production, and intermediate imports used in manufacturing, especially in light engineering, which is the main focus of Ethiopia's industrialisation strategy, but also on improving logistics of exports. This is partly because of the low levels of production of exportable goods but also can be attributed to logistic difficulties such as delays, leading to increased costs, of transport, warehousing and other logistics constraints.

[1] https://tradingeconomics.com/ethiopia/balance-of-trade

Logistics costs constitute 30 per cent of Gross Domestic Product (GDP) and the Government of Ethiopia's goal has been to reduce it to less than 22 per cent by 2020, and it is clear that this target has been missed. The fact still remains that future economic development, job creation and poverty reduction efforts of the Government of Ethiopia are reliant on improving trade logistics, which affects all productive sectors of the economy.

The policy response of government to address these logistics challenges are in the first and second Growth and Transformation Plan of Ethiopia (2010-15 and 2015-2020) and in the Home-grown Economic Reform Agenda. More recently, the Council of Ministers approved the National Logistics Strategy (NLS), created the Logistics Transformation Office (LTO) mandated to implement the NLS and address all logistics issues, and established the National Logistics Council.

The purpose of the NLS is to assist with national development; control avoidable logistics costs and reduce the overall costs of transport, port handling, transaction, storage services and container demurrages. The strategy also addresses optimisation of inventories; provision of systematic logistics solutions; and provision of direction and leadership. Efforts have also been made to ensure that the NLS is aligned with other relevant national strategies including the Industrial Development Strategy; Rural and Agricultural Development Policy; Urban Development Policy and Strategy; and the Foreign Affairs and National Security Policy and Strategy. The NLS is also aligned with GTP II.

The NLS was prepared by the Ethiopian Maritime Authority (EMA), based on findings of a draft prepared by Nathan Associates Inc., an international consultancy company, who were financed by the United Nations Development Program (UNDP). EMA carried out a detailed analysis of the current freight logistics system and its main characteristics and performances and all findings and proposals were validated through discussion groups and consultation fora.

The NLS is presented in four parts:

Part One: Purpose and Bases of the Strategy

Part Two: Ethiopia's Logistics Performance

Part Three: Vision, Mission and Strategic Objectives and Targets

- Strategy 1: Transform logistics service delivery and capacity of operators
- Strategy 2: Develop and strengthen logistics sector policies and legal frameworks
- Strategy 3: Establish an efficient and reliable transit and customs system
- Strategy 4: Implement reliable trade and finance system to enhance logistics facilitation role.
- Strategy 5: Develop Logistics Infrastructure.
- Strategy 6: Strengthen regulators institutional capacity, qualifications of human capital, and create efficient governance

Part Four: Outlines government measures, roles of stakeholders, follow-up and evaluation systems in Strategy Implementation.

2 Objectives of the Logistics Masterplan Diagnostic Study

The objectives of this Study are to carry out a diagnostic of the Ethiopian surface (land and sea) freight logistics sector, which will include transport and transit corridor logistics as well as domestic freight logistics in Ethiopia. The primary objective is to provide information and statistics on surface-based freight logistics in Ethiopia that can be used by the team of experts who will do the Logistics Masterplan and Implementation Plan. The Implementation Plan will comprise Business Plans for investment opportunities in the Logistics Sector.

The Diagnostic Study will be done primarily by both international and locally employed consultants. These consultants will liaise with staff of relevant Ministries, Agencies, Cooperatives, Transport Associations, etc. The Diagnostic Study will be overseen by the Head of the Logistics Transformation Office (LTO), who may convene a steering committee to provide guidance and advice to the team doing the implementation of the diagnostic phase.

To ensure compliance with the National Logistics Strategy and logistics-related policies and directives, the Head of the LTO will be supported by a Logistics Policy Adviser who will be a local expert that has experience with working with the National Logistics Strategy, an understanding of the practical and theoretical aspects of logistics and strong links with the private sector transport and logistics service providers.

The Team Leader (KE1) of the Diagnostic Study will be the Team Leader of the EU-financed Ethiopian Transport and Logistics Support Programme (ETLSP). He will be assisted by the Senior Logistics Expert (KE2) on the EU-financed ETLSP.

3 Methodology

The Diagnostic Study is limited to surface-based freight logistics systems, meaning that logistics systems linked to ocean shipping, rail and road modes of freight transport are addressed but the Study does not address logistics which are based on air transport, nor does it address passenger logistics.

For airfreight logistics, LTO will consult with Ministry of Transport and Logistics and Ethiopian Airlines to see whether additional Terms of Reference should be developed to do, first a Diagnostic Study, and then Terms of Reference for an Airfreight National Logistics Masterplan that could be a component of the final National Logistics Plan.

The Diagnostic Study will be implemented by a combination of locally based and international consultants, or non-key experts (NKEs), who will work together to produce a diagnostic that can be used to develop a National Logistics Master Plan and Implementation Plan. The NKEs to be recruited are as follows:

- NKE5: Logistics Policy Adviser
- NKE6: TTTFP Expert
- NKE7: Railway Expert
- NKE8: Road Engineer (Operations)
- NKE9: Road Engineer (Design)
- NKE10: O/D Survey and Freight Projections Expert
- NKE11: Shipping Data Expert
- NKE12: Warehousing and Logistics Systems Expert
- NKE13: PPP and Financing Specialist

In addition, an Ethiopian company, organisation or institution will be recruited under a lumpsum contract for a data collection exercise with the data to be collected being defined in detail.

The Diagnostics Study will include:

- A review of existing national and regional studies, policies, rules, regulations, strategies, proclamations, procedures, masterplans (such as existing road, rail and air transport masterplans and strategies) and performance reviews, and other relevant documents, and use them, where appropriate, as background and reference material for the Masterplan.

This will also include a review of the current Transport Masterplan so that relevant material can be included in the Logistics Masterplan.

- A mapping of existing monthly freight movements, by volume, over the last 5 years, and an estimate of the volumes, by month, of freight volumes, for the following:
    - Domestic agricultural products, geographical production and consumption zones
    - Domestic Industrial Products production and consumption zones
    - Source of Export Products with crop seasonality and export destinations for agricultural export products; mineral products; and industrial products.
- Mapping import products and origins, distribution channels with all the required detail identification of population definition, population size determination for each geographic location, sample size determination, sampling technique determination, etc (see Nathan Diagnostics study of NLS).
- Assessing the existing Business Processes, workflows of the various direct logistics service providers and other stake holders.
- Assessing importers and exporters, stakeholders and collaborators' needs and challenges.
- Assessing the existing ICT systems and infrastructures in the logistics sector.
- Surveying or visiting, as necessary, all infrastructure and prospective logistics provision locations.
- A thorough depiction of trade and logistics operational chains, particularly seaport and dry port operations, taking into consideration that Ethiopia is a land-locked country.
- A review of other relevant data available related to logistics inside and outside Ethiopia, including service providers and other stake holders.
- Gap and comparative analysis and benchmarking with other successful and world class trade logistics systems.
- An assessment of relevant national and international standards, rules and regulations that Ethiopia should take account of in preparing a Logistics Masterplan.
- Interviews and Focus Group Discussions (FGDs) with relevant stakeholders.

The Diagnostic Study will also address Climate Change issues, especially in terms of what climate mitigation and adaptation measures can be included into the Logistics Masterplan. Adaptation and mitigation measures may include, for example, the design of user-pays roads with stronger pavements capable of carrying heavier loads, so higher gross vehicle masses than currently acceptable, and a modification of infrastructure to cater for electric vehicles.

The Diagnostic Study will also take account of recent policy and regulatory changes, and proposed changes, that affect the transport and logistics sectors, including the easing of the FOB regulation and use of multimodal transport systems, which affects the ratio of imports handled by ESLSE as a parastatal company and private sector companies who have access to their own foreign currency.

4 Summary of Inputs and Expected Outputs

The following Key Experts (KE) and Non-Key Experts (NKE) will work on the Ethiopia Logistics Masterplan Diagnostic:

Expert	Title	Summary of Main Responsibilities
KE1	Team Leader	- Contract management of all NKEs - Supervision of all NKEs - Summary of the main findings and recommendations of previous studies and literature on the Ethiopian Logistics Sector - Preparing the section on climate change issues in the Diagnostic Report - Macroeconomic Context and Situational Analysis - Legal and Regulatory Environment Governing the Logistics Sector - Buy-Ship-Pay Model for Ethiopia and description of the Customs clearance processes - Compiling the final Diagnostic from all inputs from the KEs and NKEs
KE2	Transport and Logistics Expert	- Support NKE5 and assist in stakeholder meetings - Supervision of, and support to the data collection exercise, including participation in as many stakeholder interviews and meetings as possible and advocacy and dissemination of results - Legal and Regulatory Environment Governing the Logistics Sector
NKE5	Logistics Policy Adviser	- Policy briefs for the Minister of Transport and Logistics, for the ED of EMA and for the NLC - Advocacy and briefing meetings on Logistics with stakeholders
NKE6	TTTFP Expert	- Updated TTTFP Baseline Survey, using the same format as the original Baseline Survey Report - Gap analysis of the VLMS, CBRTA and TRIPS
NKE7	Railway Expert	- Provide an analysis of previous studies and reports on the Ethiopia Djibouti SGR and provide the main findings from these reports and studies. - Provide a description of the current operating structure of the Ethiopia-Djibouti railways. - Make recommendations on how the operations of the Ethiopia-Djibouti Railway could be improved. - Make recommendations on how the Ethiopia-Djibouti railway could operate to its design specifications of operating 8-10 trains a day between Addis Ababa and Djibouti. - Provide examples of how railway operations that provide a cross-border service, including railway systems in Europe and North America, are structured, what the strengths and weaknesses of these structures are, and what could be applied in the Ethiopia-Djibouti context.
NKE8	Road Engineer (Operations)	- Analysis of relevant work done in the Road Sector in the last 10 years and provide a list of recommendations and conclusions from these studies and other reports. - Together with the Road Engineer (Design) work with ERA to improve their capacity to read and interpret road condition survey data and in using road condition data in planning of maintenance schedules. - Plot the locations and types of weighbridges and make recommendations on the placing of weighbridges, and types of weighbridges to allow Ethiopia to comply with the TTTFP VLMA. - Together with the Road Engineer (Design), make recommendations on how the design and operations of Ethiopia's highway network could be improved to improve the efficiency of transport of freight.
NKE9	Road Engineer (Design)	- Together with the Road Engineer (Operations) work with ERA to improve their capacity to read and interpret road condition survey data and in using road condition data in planning of maintenance schedules - Design a pilot programme for High-Capacity Vehicles and decarbonising road freight on the Ethio-Djibouti Corridor.

Expert	Title	Summary of Main Responsibilities
		- Examine the feasibility of designing of road pavements for use exclusively for axle loads that are higher than the standard axle loads given in the Tripartite VLMA. - Together with the Road Engineer (Operations), make recommendations on how the design and operations of Ethiopia's highway network could be improved to improve the efficiency of transport of freight.
NKE10	O/D Survey and Freight Projections Expert	- Prepare an O/D matrix and graphical illustrations of the volumes of imports (fuel, fertiliser, wheat, coal, steel and containerised cargo) over the last 5 years from port of origin (meaning the port of arrival – Djibouti, Port Sudan, Mombasa, Berbera) to destination (meaning where the journey from the port ends). - Prepare an O/D matrix and graphical illustrations of the volumes of exports over the last 5 years from origin (meaning the region or town the export originates from) to destination (meaning the port where the journey from the origin ends). - Develop a simulation model that will predict volumes of cargo (imports and exports) through specified nodes and routes.
NKE11	Shipping Data Expert	- Using data from Linescape, Drewrys and the relevant ports, create a database, and from this database, create tables and graphics that show details of intra-regional and extra regional liner services calling at the ports of Djibouti, Port Sudan, Massawa, Assab, Mogadishu and Mombasa, carrying capacities, numbers of containers offloaded and unloaded and vessel sizes.
NKE12	Warehousing and Logistics Systems Expert	- Carry out a SWOT and gap analysis for the ICD and warehouse market in Ethiopia. - Provide a high-level characterisation of the ICD and warehouse market in Ethiopia, including an infrastructure analysis and trade overview, location, capacity and cargo flows based on data provided to the NKE from the data collection exercise. - Provide a corridor analysis for containerised trade between Addis Ababa and Djibouti port. - Provide a market assessment for ICD's, including a high-level forecast of cargo and revenues, based on data provided to the NKE from the data collection exercise. - Prepare a high-level proposal for a new logistics development (ICD, warehouse or logistic hub) aligned with private sector interests and considering a possible PPP framework for local and international investors. - Develop a strategy for state owned ICDs and warehouses, based on previous findings and in main stakeholder's interests. - Examine the feasibility of constructing silos for fertiliser and grain in Ethiopia as part of the supply chain and to ease dry-bulk logistics.
NKE13	PPP and Financing Expert	- Examine alternatives for rail infrastructure financing in Ethiopia and the pre-conditions to be in place for EDR to become either a Joint Venture with an outside bidder or operate as a concession or to concession out rail services. - Provide a market assessment and terms of reference for a transaction advisory service for EDR and ERC. - Examine what instruments and mechanisms could be in place that will allow the private sector, both as local and international investors, to invest and be involved in the operations of freight transport (road and rail), warehousing (including silos) and logistics service providers in Ethiopia.

Expert	Title	Summary of Main Responsibilities
		- Provide options that could be used to finance infrastructure and transport and logistics services, including warehousing financing and financing of silos in Ethiopia.

5 NKE6: TTTFP Expert Terms of Reference

The main task of the TTTFP Expert will be to work with the Ethiopian Road Authority, Ministry of Transport and Logistics and the Secretariat of the Tripartite Transport and Transit Facilitation Programme (TTTFP) based in COMESA (which is the Secretariat responsible for supporting implementation of the TTTFP in Ethiopia) to update the TTTFP baseline study and to develop an implementation programme that will assist Ethiopia to implement the TTTFP.

Vehicle Load Management Agreement

Roads are designed for a lifespan of a certain number of standard axle loads, with a standard axle load defined as a single axle with dual wheels with 80 kilo Newtons (kN) weight on the axle, which is roughly equivalent to 8.16 tons. Weight restrictions in the COMESA region, which have been adopted in the COMESA-EAC-SADC Tripartite region, are 8 tons on the driving axle and on a single axle with dual wheels, 16 tons on a double-axle with dual wheels and 24 tons on a triple-axle with dual wheels. If a truck is overloaded it makes the truck unsafe to drive as the tyres, suspension, braking system and transmission are designed for a specific maximum load and not more than this. This means that the truck stands more chance of tyre blow-outs, has longer stopping distances, is less stable in motion, and has more chance of breaking down if it is run overloaded. In addition, overloading a vehicle causes exponential damage to roads that are designed to carry vehicles with a standard axle load.

In Ethiopia, trucks are institutionally overloaded, meaning that the weight restrictions are well above the design specifications of the roads. Traditionally, Ethiopia uses 6-axle trucks, but the allowed weight of the load is 40 tons. The tare (or unloaded) weight of the truck will be about 18 tons, depending on the manufacturer of the horse and trailer or the truck/trailer combination. This means that a loaded 6-axle truck in Ethiopia can weigh up to 58 tons, or more, which is about 10 tons heavier than it should be. This equates to an overloading of about 20 per cent. A 20 per cent overload will result in a percentage increase in damage to the road of 105 per cent[2]. This means that a road that is designed to last for 20 years will be destroyed in 9.8 years and will need to be completely rebuilt, from the sub-base up, in less than half the design life of the road.

Ethiopia is a signatory to the Vehicle Load Management Agreement (VLMA) and has committed to implementing the VLMA.

Multilateral Cross Border Road Transport Agreement (MCBRTA)

The MCBRTA is a pillar of the Tripartite Transport and Transit Facilitation Programme, which is signed by 21 Member States of the COMESA-EAC-SADC Tripartite, including Ethiopia, Djibouti, Eritrea, South Sudan, Sudan, Kenya, Tanzania, Uganda, Rwanda, Burundi and DR Congo. The MCBRTA is governed by the following principles:

[2] The damage to the road is calculated using the 4th power rule which is calculated as the number of standard axle repetitions = (load on axle group/standard load for axle group). Overloaded trucks may also cause bridges to collapse but, in the case of a bridge, overloading is a function of the weight on the axles, the distance between axles and the number of axles.

a) Quality regulation is adopted as the basis for regional cross-border road transport regulation instead of quantity regulation.
b) The phased repealing, annulment and termination of measures to regulate the quantity of transport supplied will be applied, for the purpose of cross-border carriage of goods and passengers in their national policies and legislation.
c) Each Party grants permission to all other Parties for access to transportation in its territory by transport operators providing regional and defined international transport services who are registered in terms of the MCBRTA.
d) A harmonised and integrated Operator Registration System is established.
e) Standardised registration and fitness requirements of vehicles owned or operated by registered transport operators are to be implemented.
f) A standardised driver registration system will be established based on standardised driving licence categories for professional drivers of heavy goods and passenger vehicles in the employ of registered transport operators.
g) A system will be created by which nationally registered transport operators will be issued with cross-border operator disks for vehicles to be used in cross-border road transport.
h) Uniform procedures for warrants of arrest and prosecutions for offences committed by foreign drivers will be implemented with a harmonised schedule of penalties and demerit points as sanctions in respect of administratively adjudicated violations to be implemented against transgressing transport operators and drivers.
i) An integrated transgression monitoring system will be established to record offences and violations by transport operators.
j) The provisions of the MCBRTA shall not derogate from the application of the provisions of national laws and regulations imposing any restrictions and controls on the grounds of public health, road traffic, veterinary, phyto or pathological reasons, or the dues chargeable by virtue of such laws and regulations of a Party.

The Implementation Framework (Article 18) of the MCBRTA commits the Parties to develop an implementation schedule and:

a) Within one year of signing the MCBRTA, designate the Competent Authority to liaise with the Tripartite Cross-Border Road Transport Commission (the Commission) in the development and introduction of the TRIPS system in relation to cross-border road transport.
b) Within one year, establish an effective communication body between the Competent Authority and the domestic road freight and passenger operator associations regarding the TRIPS development process.
c) Within two years, remove all regulatory measures intended to limit or control the supply of transport of passengers and goods in cross-border road transport between the territories of the Parties.
d) Within two years, remove and terminate the requirement for specific permits for cross-border road transport by registered transport operators.
e) Within two years, introduce harmonised charges for all road traffic and transport transgressions, together with a demerit points system to enable consistent and equal treatment of domestic and foreign drivers and transport operators.
f) Within two years initiate the process of making such necessary changes to domestic legislation to introduce and support all elements of TRIPS and the related Operator Registration System, Transgression System and supporting National Transport Information

System to provide computerised services for the administration of vehicle registration, roadworthiness testing, as well as driver and professional driver assessment and licensing.

g) Within four years, evaluate and, if so decided, provide for future permission of cabotage in their territories.

In developing a work plan to implement the VLMA and the MCBRTA, it is necessary to conduct a baseline survey for Ethiopia to gauge where Ethiopia is in terms of policies, laws, regulations and mechanisms so as to know what needed to be changed and in which direction. The baseline survey would assess the state of compliance with the regional baseline requirements for harmonised standards, procedures and practices in transport and traffic related matters in the Tripartite Region.

The following deliverables are expected:

1) An update of the Ethiopia Transport and Transit Facilitation Programme Baseline.
2) A gap analysis of the COMESA-EAC-SADC Tripartite Vehicle Load Management Agreement (VLMA) outlining what progress has been made in implementing the VLMA and what still needs to be done.
3) A gap analysis of the COMESA-EAC-SADC Multilateral Cross-Border Road Transport Agreement (MCBRTA) outlining what progress has been made in implementing the MCBTRA and what still needs to be done.
4) A gap analysis of the COMESA-EAC-SADC Tripartite Transport Registers and Information Platform and System (TRIPS) outlining what progress has been made in implementing the TRIPS and what still needs to be done.
5) Recommendations on how Ethiopia can implement the provisions of the TTTFP within the time periods envisaged in the TTTFP.

A total input of 20 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

6 Railway Expert Terms of Reference

The Addis Ababa–Djibouti Railway is a standard gauge international railway that serves as the backbone of the new Ethiopian National Railway Network. The railway was inaugurated by Prime Minister Hailemariam Desalegn on 1st January 2018. It provides landlocked Ethiopia with access to the sea, linking Ethiopia's capital of Addis Ababa with Djibouti port. About 90 to 95 per cent of Ethiopia's trade passes through Djibouti, accounting for about 70 per cent of the activity at the Port of Djibouti.

The total railway design capacity is 24.9 million tonnes of freight annually, with this target to be achieved incrementally, with the aim of reaching 10 million tonnes of cargo by 2022.

The Ethio-Djibouti Standard Gauge Rail Transport S.C., a bi-national public company headquartered in Addis Ababa, was formed in 2017 to operate the railway. It is owned by the governments of Ethiopia (75 per cent share) and Djibouti (25 per cent share). Ethiopia holds the CEO post, represented through the Ethiopian Minister of Transport. The company currently occupies an administrative role, but it will take over railway operations at the beginning of 2024.

Through 2023, all operations on the new railway will be undertaken jointly by the China Railway Group Limited (CREC) and the China Civil Engineering Construction Corporation (CCECC). During this time, the companies will train local employees so that they can take over railway operations at the

conclusion of the initial operation period. The Ethiopian Railway Corporation has also established the African Railway Academy in Bishoftu to graduate rail engineers.

The railway begins at Sebeta, just outside of Ethiopia's capital of Addis Ababa. The city is served by two stations in its southern outskirts, at Furi-Lebu and Indode. The line then runs southeast to Modjo and Adama, both towns located in the Ethiopian Great Rift Valley. At Modjo, a railway junction exists for the planned Modjo–Hawassa Railway. In addition, at Modjo the railway is connected to the Modjo Dry Port, Ethiopia's most important inland dry port and also Ethiopia's main hub for domestic and international freight services.

There are 21 dedicated railway stations along the railway, all of them can serve as passing loop stations, as they have three tracks or more (except the Adigala station which has only two tracks). Four of the 21 railway stations are designed as passing loops only, so there is no freight loading/ unloading or passenger service. Two of the remaining 17 stations are freight yards only and two others will be for passengers only. The remaining 13 stations can handle both passenger services as well as freight loading/unloading.

The 15 passenger stations usually have a single boarding platform, with a station building attached to it. The platforms are about 200, 300, or 400 meters long. The Awash station, the only one with three platforms, is also located along the railway but also at the junction point with the Awash–Hara Gebeya Railway. The Furi-Labu and Dewale stations have two platforms.

The Addis Ababa–Djibouti Railway was based on the Chinese National Railway Class 2 Standard. However, some changes were made at the request of the Ethiopian Railway Corporation.

Basic facts:

- Gauge: Standard gauge
- Couplers: Janney AAR
- Brakes: Air
- Electrification: Overhead catenary 25 kV AC / 50 Hz
- Target speed (passenger): 120 km/h
- Target speed (freight): 80 km/h
- Maximum train load (freight): 3,500 ± 93 tonnes gross
- Designed transport capacity: 20 million tonnes annually
- Gross transport capacity: 24.9 million tonnes annually (taking double-track sections into account)
- Minimum railway curve radius: 1,200 m (800m at difficult locations)
- Maximum (ruling) gradient: 1.85 per cent (1 in 54)
- Length of passing loops: 850m (dual locomotive: 880 m), which means that the maximum train length is restricted to 800m
- Maximum vehicle loading gauge: height: 5300 mm; width: 3400 mm
- Trains run on the: Left
- Railway signalling: Automatic block signalling
- Train protection system: ETCS-2 SIL4
- Level crossings: permitted (no full grade separation)

The railway line is almost fully electrified. Power is transmitted at 230 kV and 130 kV to eight substations. Traction power is supplied at 35.8 km intervals, with 18+1 stations in Ethiopia and three in Djibouti. General electrification ends after the Djibouti–Nagad passenger station. Trains are pulled by diesel locomotives to reach the Port of Doraleh and cargo terminals at inland dry ports. This is necessary to avoid interference between the overhead catenary and loading cranes.

The following deliverables are expected:

1) Provide an analysis of previous studies and reports on the Ethiopia Djibouti SGR and provide the main findings from these reports and studies. These studies will be provided to the Railway Experts once the contracts have been signed.
2) Provide a description of the current operating structure of the Ethiopia-Djibouti railways.
3) Make recommendations on how the operations of the Ethiopia-Djibouti Railway could be improved, without major infrastructure investments, in terms of efficiency of the freight service in particular.
4) Make recommendations on how the Ethiopia-Djibouti railway could operate to its design specifications of operating 8-10 trains a day between Addis Ababa and Djibouti. This may include recommendations regarding infrastructure, rolling stock and locomotives, signalling, commercial operations and management systems.
5) Provide examples of how railway operations that provide a cross-border service, including railway systems in Europe and North America, are structured, what the strengths and weaknesses of these structures are, and what could be applied in the Ethiopia-Djibouti context.
6) Provide recommendations on how the Ethiopia-Djibouti Railway could be structured including recommendations on ownership of the company, possible concessioning, shareholding structure of the company and how the Ethiopia-Djibouti railway could be regulated.

A total input of 30 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

7 Terms of Reference for NKE8: Road Engineer (Operations)

The following deliverables are expected:

1) Analysis of relevant work done in the Road Sector in the last 10 years and provide a list of recommendations and conclusions from these studies and other reports.
2) Together with the Road Engineer (Design) work with ERA to improve their capacity to read and interpret road condition survey data and in using road condition data in planning of maintenance schedules.
3) Plot the locations and types of weighbridges and make recommendations on the placing of weighbridges, and types of weighbridges to allow Ethiopia to comply with the TTTFP VLMA.
4) Together with the Road Engineer (Design), make recommendations on how the design and operations of Ethiopia's highway network could be improved to improve the efficiency of transport of freight.

A total input of 20 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

8 Terms of Reference for NKE9: Road Engineer (Design)

The following deliverables are expected:

1) Together with the Road Engineer (Operations) work with ERA to improve their capacity to read and interpret road condition survey data and in using road condition data in planning of maintenance schedules

2) Design a pilot programme for High-Capacity Vehicles and decarbonising road freight on the Ethio-Djibouti Corridor.

   "High-Capacity Vehicles" (HCVs) are trucks or truck combinations which are designed to carry more freight than conventional vehicles, through concessions on legislated weight and/or dimension regulations. The result is a more efficient transport system in which the same freight volumes can be moved using fewer trucks and trips.

   The use of HCVs has been successfully trialled or implemented in South Africa, Australia, New Zealand, Canada, and parts of Europe. Such programmes typically require assurances regarding the safe design of the trucks, approved routes, safe and professional management of the transport operation, road wear impact reduction, and vehicle monitoring.

   In South Africa, the National Department of Transport has supported a special trial of HCVs since 2007. The pilot project, known as the "Smart Truck" or "Performance-Based Standards" (PBS) pilot project, has demonstrated improvements in the efficiency, with reduced costs per tonne-km, while reducing emissions and improving safety. The vehicles operate on fixed pre-approved routes assessed to be suitable and safe for the type of truck, which undergo detailed assessments of low-speed and high-speed truck safety, road wear impact, and bridge loading impact against a set of strict standards before approval.

3) Examine the feasibility of designing road pavements for use exclusively for axle loads that are higher than the standard axle loads given in the Tripartite VLMA.

4) Together with the Road Engineer (Operations), make recommendations on how the design and operations of Ethiopia's highway network could be improved to improve the efficiency of transport of freight.

5) Provide a theoretical analysis of how much it would cost, in construction costs only, using a roughly estimated average construction cost per kilometre, and roughly estimated routine and periodic maintenance costs per kilometre per year to upgrade the road from Addis Ababa to Galafi border post to a 4-lane highway and then to maintain that road to a good standard (i.e. with an IRI of 2.5 or less) for a range of traffic levels and a range of levels of overloading. The NKE will develop a model that calculates annual maintenance costs for different road sections between Addis Ababa and Galafi. The outputs will be "ballpark" annual maintenance costs based on various levels of pavement deterioration caused by various traffic levels and percentages of overloading. The variables will be traffic levels and percentage overloading.

A total input of 30 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

9 Terms of Reference for NKE10: O/D Survey and Freight Projections Expert

The following deliverables are expected:

1) Based on the origin/destination information provided to the NKE, prepare an O/D matrix and graphical illustrations of the volumes of imports (fuel, fertiliser, wheat, coal, steel and containerised cargo) over the last 5 years from port of origin (meaning the port of arrival – Djibouti, Port Sudan, Mombasa, Berbera) to destination (meaning where the journey from the port ends).
2) Based on the origin/destination information provided to the NKE, prepare an O/D matrix and graphical illustrations of the volumes of exports over the last 5 years from origin (meaning the region or town the export originates from) to destination (meaning the port where the journey from the origin ends).
3) Develop a simulation model that will predict volumes of cargo (imports and exports) through specified nodes and routes. The projected volumes of cargo will be regional (meaning that the projections will be to and from each region in Ethiopia) and port pairings. The simulations will be based on socio-economic assumptions which will be derived from economic growth rate figures and from discussions with the Ethiopian Administration and other economic operators.

A total input of 25 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

10 Terms of Reference for NKE12: Shipping Data Expert

Ethiopia uses, primarily, the ports of Djibouti (which accounts for about 90% of Ethiopian imports and exports), Berbera (Somaliland), Port Sudan (Sudan) and Mombasa.

Djibouti ports handle most of Ethiopia's maritime traffic, which moves to and from Addis Ababa (mainly Modjo Dry Port which is about 70km from Addis Ababa) mainly by road, but cargo is moving onto the new standard gauge railway. Djibouti Ports and Free Zones Authority (DPFZA) have announced that they will be expanding their ports with the development of the new Djibouti International Container Terminal (DICT), to boost the capacity of SGTD (previously DCT) by 2.5 million TEU in the first phase). DITC is to be located between SGTD and DMP where the water depth is 18.5m. DPFZA is also constructing the Djibouti Damerjog Industries Development (DDID) that is planned to be a multipurpose port, livestock terminal, a refinery, storage tanks, dry dock, gas complex and jetty for refined and crude oil.

The port of Berbera handles bulk and containerised imports, mostly arriving via Dubai. Imports are dominated by petrol, vehicles, building materials, textiles, electronics, sugar, rice, wheat and other foodstuffs, including food aid for the region imported by the UN's World Food Program (WFP). In addition, Berbera exports around three million head of livestock to the Arabian Peninsula every year. In 2016, DP World won a 30-year concession with an automatic 10-year extension for the management and development of a multi-purpose port project at Berbera. DP World has set up a joint venture with the Government of Somaliland and British International Investment (BII – used to be CDC) being the other shareholders. The Government of Ethiopia, through ESLSE, were offered a 19 percent shareholding but ESLSE did not take up the offer and it has since been withdrawn although negotiations are ongoing to reinstate this offer.

DP World has invested about US$442 million in Berbera port which includes a first phase of a 400-metre quay and 250,000 square metre yard extension. Equipment includes 3 new ship-to-shore post Panamax gantry cranes and 7 new rubber-tire-gantry (RTG) cranes, and reach stackers. On completion, the port will have a container throughput capacity of 450,000 TEU per annum and an increase in its capacity to handle general cargo, bulk and break-bulk cargo from 1,500,000 MT to 2,000,000 MT.

The port of Mombasa, a feeder port and an important regional port, is Kenya's primary port, and the main gateway and exit port for the landlocked countries of Uganda, northern Tanzania, Burundi, Rwanda, South Sudan, and the eastern regions of DR Congo. There is also a good road link from Ethiopia, through the one-stop border post (OSBP) of Moyale to Mombasa. Using a regular feeder system, the port is connected to Mogadishu, Dar es Salaam, and transhipment hubs such as Djibouti, Durban, and Salalah.

Port Sudan is connected to the Red Sea by an 18-26-metre-deep coral-free channel. In addition to modern dock facilities, Port Sudan hosts an oil refinery and an international airport. Petroleum comes to the Port Sudan refinery from on-shore wells and an 850-kilometer pipeline to Khartoum that was finished in 1977.

The current Assab port in Eritrea used to be the main port serving Addis Ababa prior to the 1998-2000 war between Ethiopia and Eritrea. Assab also used to supply Ethiopia with oil products from its oil refinery which was built in the 1970s by the former USSR. However, Ethiopia had stopped buying refined oil products from the Assab oil refinery even before the war started.

Massawa port is home to a naval base and large dhow docks. It also has a station on the railway line to Asmara. Ferries sail to the Dahlak Islands and the nearby Sheikh Saeed Island, aka Green Island. The port has six cargo berths with a total length of 1007 metres, with four of these berths forming a continuous length and a newly developed container terminal. One of the main physical challenges of using Massawa as a port for Ethiopia is the road link between Massawa and Ethiopia which goes through the capital Asmara. The distance between Massawa and Asmara is 110km but the difference in altitude is 2,000 metres, meaning that the gradients on the roads are very steep, translating into sharp bends, which limits the length of trucks that can use the road, the need for trucks to be in good condition and an expensive journey in terms of fuel used per ton/kilometre.

The Shipping Data Expert is expected to deliver the following:

- Using data from Linescape, Drewry and the relevant ports, create an historical database, and from this database, create tables and graphics that show details of intra-regional and extra regional liner services calling at the ports of Djibouti, Port Sudan, Massawa, Assab, Mogadishu and Mombasa, carrying capacities, numbers of containers offloaded and unloaded and vessel sizes.
- Analyse the full costs to the Ethiopian importer and exporter of using the ports for Ethiopian imports and exports and disaggregate these costs by service provided and by commodity and for containers, wet bulk and dry bulk.
- Compare these prices to services offered at other regional ports.
- Make recommendations on how port handling charges can be reduced for Ethiopian imports and exports at the ports mentioned above through efficiency gains, reducing dwell times, reducing time spent at the port, improved loading and unloading systems and port entry and discharge systems, improved container handling, and through negotiation on prices.

A total input of 15 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

11 NKE12 Terms of Reference: Warehousing and Logistics Expert

Industrial Parks

One of the main pillars of Ethiopian Government policy is to build a solid and vibrant industrial base and for Ethiopia to be among the leading manufacturing hubs in Africa, with a focus on light manufacturing. Ethiopia's industrialisation approach includes, first and foremost, developing specialised industrial parks, maintaining social and environmental sustainability, building vertically integrated industries, horizontally synchronised supply chains, and enhancing skills development and doing this with strong collaboration with the private sector, including global players and international investors.

The Government of Ethiopia is establishing over 20 industrial parks located along key development corridors, each with distinct specialty in priority sectors. Currently, there are 7 industrial parks in operation.

The industrial parks are all being developed and financed through different mechanisms to try to ensure a sustainable and inclusive partnership between the Government and private industrial park developers.

The industrial parks' key anchor principles are:

- Specialised parks: Enhancing economy of scale and efficiency through the development of specialised/clustered industrial parks that are dedicated to priority sectors such as apparel and textile, leather and leather products, pharmaceuticals, agro processing etc;
- Export-oriented: Government provision of industrial park incentives and support measures targeted at increased export performance and competitiveness;
- Skills development and competitiveness: Creating and developing a pool of trained industrial work force and enabling environment for skills attraction and retention which will lead to enterprise competitiveness;
- Vertical integration: Enhancing backward and forward linkages in the economy;
- Sustainability: Maintaining high environmental standards by applying cutting edge environment friendly technologies (zero liquid discharge systems) and other social sustainability standards.

Dry Ports

Ethiopia started developing dry ports following a 2007 study by the then Ministry of Transport and Communications, (now Ministry of transport and Logistics) which suggested that the country could save foreign currency from seaport expenses at Djibouti, by building dry ports within the country. The dry ports would be able to handle customs inspections, documentation of cargo and packaging for import and export. The saving, according to the study, could be seven to eight US Dollars for every container that was transported through Djibouti. Consequently, the Modjo Dry Port, 73Km east of the capital, was built on a 63ha plot and started operations in 2009. Use of the Modjo Dry Port increased in February 2012, when the multimodal transport system, operated by ESLSE as a monopoly, came into operation.

Ethiopia now has eight operational inland dry ports at Modjo, Kaliti, Semera, Mek'ele, Dire Dawa, Gelan, Kombolcha and Wereta, with a total installed handling capacity of 22,000 TEUs. The biggest and most developed is the Modjo dry port, which has been undergoing development since 2010.

Modjo Dry port has benefitted from a loan of US$150 million from the World Bank under the Ethiopian Trade Logistics Project (ETLP). The objective of the ETLP is to enhance the performance of the corridor linking the port of Djibouti to Modjo through improvements in operational capacity, efficiency and range of logistics services at the Modjo Dry Port. The project is achieving this through investments in physical infrastructure, ICT systems and support for regulatory improvements. This is projected to lead to increased exports, raising incomes of producers and traders, and the generation of new jobs. Project beneficiaries are expected to be private sector exporters, importers, manufacturers and farmers, those working for companies producing goods for export, government agencies involved in exporting and importing and consumers

The Warehouse and ICD Expert will be expected to deliver the following:

1) Carry out a SWOT and gap analysis for the ICD and warehouse market in Ethiopia.
2) Provide a high-level characterisation of the ICD and warehouse market in Ethiopia, including an infrastructure analysis and trade overview, location, capacity and cargo flows based on data provided to the NKE from the data collection exercise.
3) Provide a corridor analysis for containerised trade between Addis Ababa and Djibouti port.
4) Provide a market assessment for ICD's, including a high-level forecast of cargo and revenues, based on data provided to the NKE from the data collection exercise.
5) Prepare a high-level proposal for a new logistics development (ICD, warehouse or logistic hub) aligned with private sector interests and considering a possible PPP framework for local and international investors.
6) Develop a strategy for state owned ICDs and warehouses, based on previous findings and in main stakeholder's interests.
7) Examine the feasibility of constructing silos for fertiliser and grain in Ethiopia as part of the supply chain and to ease dry-bulk logistics.

A total input of 60 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.

12 NKE13 Terms of Reference: PPP and Financing Expert

1) Examine alternatives for rail infrastructure financing in Ethiopia and a market assessment for EDR to become either a Joint Venture with an outside bidder or operated as a concession or for ERC to concession out rail services on the Ethiopia-Djibouti SGR on a "take-or-pay" basis
2) Prepare terms of reference for a transaction advisory service for EDR.
3) Examine what instruments and mechanisms could be put in place that will allow the private sector, both as local and international investors, to invest and be involved in the operations of freight transport (road and rail), warehousing (including silos) and logistics service providers in Ethiopia.
4) Provide options that could be used to finance infrastructure and transport and logistics services, including warehousing financing and financing of silos in Ethiopia.

5) Carry out a PPP potential analysis for current state operated ICDs including market sounding for specific developments and private sector attraction.

6) Examine the options of concessioning the main trunk roads, using Addis Ababa to Galafi as the first example. The study would involve reviewing road concessioning arrangements in other parts of the world, including the public sector institutions and governance structures in place.

A total input of 45 person days will be allocated to this assignment. The timing of this input, and the number of days spent remotely, will be agreed with DT Global at the time the contract is signed.